WHAT IS CLAIMED IS:

1. An hCdc5 polypeptide comprising the amino acid sequence of SEQ ID NO: 1 or an immunogenic fragment, a biologically active fragment, or a variant thereof.

2. An antibody immunoreactive with an hCdc5 polypeptide comprising the amino acid sequence of SEQ ID NO: 1 or an immunogenic fragment, a biologically active fragment, or a variant thereof.

3. The antibody of claim 2, wherein the antibody is monoclonal.

4. A method for treating a cell cycle defect in a patient comprising administering to cells in the patient a therapeutic amount of an hCdc5 protein.

5. The method of claim 4, wherein the cell cycle defect is failure to progress through G2 and entry into mitosis.

6. The method of claim 4, wherein the hCdc5 protein is a wild-type protein.

7. The method of claim 4, wherein the hCdc5 protein has the amino acid sequence of SEQ ID NO: 1.

8. The method of claim 4, wherein the hCdc5 protein is an agonist of hCdc5.

9. The method of claim 4, wherein the cells are cardiac cells.

10. The method of claim 4, wherein the cells are muscle cells.

11. The method of claim 4, wherein the cells have an endogenous mutant hCdc5 gene.

12. The method of claim 4, wherein the patient has muscular dystrophy.

13. The method of claim 4, wherein the patient has damaged myocardium.

14. The method of claim 4, wherein the hCdc5 polypeptide is administered by gene therapy.

15. A method for treating a cell cycle defect in a patient comprising administering to cells in the patient an antagonist of hCdc5.

16. The method of claim 15, wherein the antagonist is an antibody specifically immunoreactive with hCdc5 protein.

17. The method of claim 16, wherein the hCdc5 protein is wild-type hCdc5 protein.

18. The method of claim 16, wherein the hCdc5 protein is an endogenous mutant hCdc5 protein in cells of the patient.

19. The method of claim 15, wherein the antagonist is a mutant hCdc5 protein.

20. The method of claim 19, wherein the mutant hCdc5 protein is a dominant negative mutant.

21. The method of claim 15, wherein the cells are cancer cells, vascular smooth muscle or endothelial cells, or gamete cells.

22. The method of claim 15, wherein the antagonist is an hCdc5 antisense nucleic acid.

23. The method of claim 15, wherein the antagonist is provided to the cells by gene therapy.

24. The method of claim 16, wherein the antibody is specifically reactive with the hCdc5 protein having the amino acid sequence SEQ ID NO:1.

25. A method of treating a patient having a hyperproliferative disease, said method comprising:

administering to hyperproliferative cells in the patient a nucleic acid encoding an hCdc5 polypeptide, wherein the polypeptide encoded by the nucleic acid is over-expressed in said cells, and as a result of the over-expressed polypeptide the cells die.

26. A method of regulating the progression of a cell cycle through G2 and into mitosis, comprising administering to a cell an antagonist of hCdc5.

27. The method of claim 26, wherein the cell is a gamete.

28. The method of claim 26, wherein the cell has a wild type endogenous hCdc5 gene.

29. The method of claim 26, wherein the cell is a hyperproliferative cell, cancer cell, vascular smooth muscle or endothelial cell.

30. The method of claim 26, wherein the antagonist is an antibody specifically immunoreactive with hCdc5 protein.

31. The method of claim 26, wherein the hCdc5 protein is an endogenous mutant hCdc5 protein in the cell.

32. The method of claim 26, wherein the antagonist is a mutant hCdc5 protein.

33. The method of claim 32, wherein the mutant hCdc5 protein is a dominant negative mutant.

34. The method of claim 26, wherein the antagonist is an hCdc5 antisense nucleic

acid.

35. The method of claim 26, wherein the antagonist is provided to the cell by gene therapy.

36. A method for identifying an inhibitor compound of hCdc5 binding to a DNA binding site comprising:

(a) contacting a hCdc5 polypeptide with a hCdc5 binding site nucleic acid under conditions in which the hCdc5 polypeptide binds to the hCdc5 binding site nucleic acid, wherein said hCdc5 polypeptide is selected from the group consisting of a polypeptide having the amino acid sequence of SEQ ID NO:1, a biologically active fragment thereof, and a variant thereof, and wherein said hCdc5 binding site nucleic acid comprises nucleic acid having the core sequence ANCA flanked within 3 bases by palindromic sequence;

(b) determining the affinity of binding between said hCdc5 polypeptide and said hCdc5 binding site nucleic acid,

(c) carrying out step (a) in the presence of a compound to be tested,

(d) determining the affinity of binding between said hCdc5 polypeptide and said hCdc5 binding site nucleic acid in the presence of said compound, and

(e) selecting a compound for which the affinity of binding determined in (b) is greater than the affinity of binding determined in (d).

37. The method of claim 36, wherein said hCdc5 polypeptide comprises a polypeptide having the amino acid sequence of SEQ ID NO: 1.

38. The method of claim 36, wherein said hCdc5 polypeptide comprises a biologically active fragment of a polypeptide having the amino acid sequence of SEQ ID NO: 1.

39. The method of claim 36, wherein said hCdc5 polypeptide comprises a variant of a polypeptide having the amino acid sequence of SEQ ID NO: 1.

40. The method of claim 38, wherein said fragment comprises amino acids 1 to 500 of SEQ ID NO: 1.

41. The method of claim 36, wherein said palindromic sequence is AT-rich.

42. The method of claim 36, wherein said palindromic sequence is at least three bases in length.

43. The method of claim 36, wherein said core sequence is AWCA.

44. The method of claim 36, wherein said hCdc5 binding site nucleic acid comprises

nucleic acid having the sequence TTAACATAA (SEQ ID NO:14).

45. The method of claim 36, wherein said hCdc5 binding site nucleic acid comprises a nucleic acid having the sequence selected from the group consisting of SEQ ID NO: 13, SEQ ID NO: 15, SEQ ID NO:16, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22 and SEQ ID NO:27.

46. A method for identifying an enhancer compound of hCdc5 binding to a DNA binding site comprising:

(a) contacting a hCdc5 polypeptide with a hCdc5 binding site nucleic acid under conditions in which the hCdc5 polypeptide binds to the hCdc5 binding site nucleic acid, wherein said hCdc5 polypeptide is selected from the group consisting of a polypeptide having the amino acid sequence of SEQ ID NO:1, a biologically active fragment thereof, and a variant thereof, and wherein said hCdc5 binding site nucleic acid comprises nucleic acid having the core sequence ANCA flanked within 3 bases by palindromic sequence;

(b) determining the affinity of binding between said hCdc5 polypeptide and said hCdc5 binding site nucleic acid,

(c) carrying out step (a) in the presence of a compound to be tested,

(d) determining the affinity of binding between said hCdc5 polypeptide and said hCdc5 binding site nucleic acid in the presence of said compound, and

(e) selecting a compound for which the affinity of binding determined in (b) is less than the affinity of binding determined in (d).

47. The method of claim 46, wherein said hCdc5 polypeptide comprises a polypeptide having the amino acid sequence of SEQ ID NO: 1.

48. The method of claim 46, wherein said hCdc5 polypeptide comprises a biologically active fragment of a polypeptide having the amino acid sequence of SEQ ID NO: 1.

49. The method of claim 46, wherein said hCdc5 polypeptide comprises a variant of a polypeptide having the amino acid sequence of SEQ ID NO: 1.

50. The method of claim 48, wherein said fragment comprises amino acids 1 to 500 of SEQ ID NO: 1.

51. The method of claim 46, wherein said palindromic sequence is AT-rich.

52. The method of claim 46, wherein said palindromic sequence is at least three bases in length.

53. The method of claim 46, wherein said core sequence is AWCA.

54. The method of claim 46, wherein said hCdc5 binding site nucleic acid comprises nucleic acid having the sequence TTAACATAA (SEQ ID NO:14).

55. The method of claim 46, wherein said hCdc5 binding site nucleic acid comprises a nucleic acid having the sequence selected from the group consisting of SEQ ID NO: 13, SEQ ID NO: 15, SEQ ID NO:16, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22 and SEQ ID NO:27.

56. An isolated hCdc5 binding site nucleic acid comprising nucleic acid having a sequence selected from the group consisting of SEQ ID NO: 13, SEQ ID NO:14, SEQ ID NO: 15, SEQ ID NO:16, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22 and SEQ ID NO:27.

57. A vector comprising the hCdc5 binding site nucleic acid of claim 56 operably linked to a nucleic acid encoding a protein of interest.

58. The vector of claim 57, wherein said protein of interest is a reporter protein.

59. A method of expressing a protein of interest in a cell which expresses hCdc5 comprising:

introducing the vector of claim 57 into said cell under conditions in which the hCdc5 expressed in said cell activates the transcription of said coding sequence for said protein of interest.

60. A method for detecting the presence of hCdc5 in a cell comprising:

introducing the vector of claim 58 into said cell and detecting the expression of said reporter protein.

61. The method of claim 60, wherein said reporter protein is luciferase.

62. The method of claim 15, wherein said antagonist is an inhibitor compound of hCdc5 binding to a DNA binding site.

63. The method of claim 26, wherein said antagonist is an inhibitor compound of hCdc5 binding to a DNA binding site.

64. A method of promoting cell division in cells of normally non-regenerable tissue comprising administering to said cells an agonist of hCdc5.

65. The method of claim 64, wherein said agonist is an enhancer compound of hCdc5 binding to a DNA binding site.